REMARKS/ARGUMENTS

Reconsideration and allowance of the subject application are respectfully requested.

Claims 1, 3, 5 to 10 and 12 have been amended. Claims 4 and 11 have been cancelled without prejudice or disclaimer. New claims 16 and 17 have been added. Claim 8 remains withdrawn. Claims 1, 3, 5 to 7, 9, 10, 12, 16 and 17 remain for consideration in the subject application. Claim 1 is independent.

Applicant notes with appreciation that the drawings filed on June 18, 2009 have been accepted by the Examiner.

Section 112 Rejections

The Examiner has rejected claims 1, 3 to 7 and 9 to 12 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter what the Applicant regards as the invention. Claim 1 as amended provides proper antecedent basis for the term "maximum voltage" and addresses the Examiner's rejections for use of the expression "a ramping voltage that is used during driving of columns". The Examiner's objection to the phrase "video signal gray level data" in claim 1 is, however, believed to be without merit. One of ordinary skill in the art would have no difficulty understanding the claimed subject matter. This claimed expression is not unclear as alleged. Claims 4 and 11 have been cancelled to advance examination. Claims 5 and 12 have been amended to provide proper antecedent basis for the recited terms and are believed to be complete. Accordingly, Applicant respectfully requests that this rejection be removed.

Section 103 Rejections

With respect to prior art, the Examiner has rejected claims 1, 3 to 7 and 9 to 12 under 35 §U.S.C. 103(a) as being unpatentable in view of U.S. Patent No. 6,049,320 to Yeo ("Yeo") in view of U.S. Patent No. 6,844,874 to Maurice ("Maurice"). Applicant respectfully submits that the Examiner's rejection in view of the cited references is no longer appropriate at least for the reasons set forth below.

According to the Applicant's invention as defined by independent claim 1, Applicant provides a gray scale column driver circuit for an alternating current dielectric

electroluminescent display comprising rows, columns and pixels at the intersections of the rows and columns. The gray scale column driver circuit comprises a counter receiving video signal gray level data and in response counting for a time interval proportional to the gray level data. A non linear analogue voltage ramp generator is connected to the counter. The non linear voltage ramp generator outputs a ramping voltage during the time interval. The ramping voltage conforms to a curve with an initial convex portion followed by a concave portion. The initial convex portion conforms to a negative second derivative with respect to the time interval, and the concave portion conforms to a positive second derivative with respect to the time interval. A column driver receives the ramping voltage and in response applies alternating polarity driving pulses to the columns of the dielectric electroluminescent display. The ramping voltage determines a maximum voltage of the alternating polarity driving pulses applied to the columns of the dielectric electroluminescent display by the column driver.

In contrast, Yeo discloses a gray scale driver for an active matrix liquid crystal display wherein a current flows to charge a pixel capacitor to a voltage that is non-linear with respect to time in accordance with the desired grey level. A pixel in a liquid crystal display consists of a layer of liquid crystal sandwiched between two optically transparent electrodes. The liquid crystal layer functions as a light valve to modulate the fraction of light from back-light passing through the valve to achieve the desired grey level. The fraction of light passed by the liquid crystal layer is dependent in a non-linear fashion on the voltage applied across the liquid crystal film. In the active matrix liquid crystal display (AMLCD) as taught by Yeo, the pixels are independently controlled by a thin film transistor (TFT) connected in series with each pixel. The pixel itself behaves electrically as a capacitor. The voltage across the pixel capacitor is set by allowing a current to pass through the TFT until the prescribed voltage is reached, at which time the TFT is switched off by an abrupt change in the voltage applied to the gate of the TFT. The voltage across the pixel then remains constant for the duration of a video frame at which point the TFT is turned on again to allow the voltage across the pixel to be reset in accordance with the grey level required for the next frame. The voltage applied across the pixel as a function of time while the TFT is turned on as taught by Yeo is non linear as shown in Figure 2a in order to accommodate the non linear relationship between the voltage and the fraction of light transmitted by the pixel. The voltage, however, is

applied directly to the data (column) lines of the liquid crystal display to provide gray level control. The voltage is **not** applied to a column driver as claimed.

Applicant respectfully submits that it would not be possible to apply the Yeo voltage directly to the columns of an electroluminescent display due to the need to recover and re-use energy associated with charging the very large and highly variable capacitance resulting from capacitive coupling to pixels in non-addressed rows in the dielectric electroluminescent display. The variability of the capacitance is due to large differences in the capacitive coupling between rows and columns of the electroluminescent display in response to different image patterns. Please see U.S. Patent Application Nos. 09/504,472 and 10/036,002, both of which are incorporated by reference into the specification, for an explanation of this phenomenon. These applications describe how the above-noted energy is recovered and fed to the electroluminescent display on the next video frame during addressing of a thick dielectric layer electroluminescent display using a switched sinusoidal voltage waveform fed through a step down transformer. Liquid crystal displays have dramatically lower capacitance that does not vary as a function of the image pattern and so such energy recovery means are not required.

Maurice discloses an AMLCD wherein the maximum current passing through the TFTs connected in series with the pixels is limited to avoid excessive power loss due to the electrical resistance of the TFTs. Maurice also makes reference to an alternate embodiment of the means used to limit the current as applied to an electroluminescent element. However, it is clear from the discussion of Maurice that Maurice is referring to a direct current (dc) electroluminescent element, as shown in Figure 3 and described at column 5, lines 23 to 28. Note that in Figure 3 the voltage across the electroluminescent element always has the same polarity. This type of electroluminescent element, as is well known in the art, consists of a phosphor layer sandwiched between two electrodes so that a dc current can be passed through the electroluminescent element. The dc electroluminescent element is **not** amenable to gray scale control through the use of a curved voltage ramp. Rather, gray scale control in such a dc electroluminescent element is effected by pulse width modulation of the dc current applied to the electroluminescent element wherein current switching is controlled by the transistor to which the ramp voltage is applied. The use of a curved

voltage ramp provides no benefit and as a result, one of ordinary skill in the art would **not** combine the teachings of Maurice and Yeo as alleged.

By contrast, Applicant's invention relates to a gray scale column driver circuit for an alternating current dielectric electroluminescent display, wherein the counter and voltage ramp generator are used to generate reference voltage levels for each gray level that are applied to a conventional column driver (see paragraph [0036]). Neither Yeo nor Maurice, alone or in combination, teaches or suggests ***a ramping voltage generated by an analogue voltage ramp generator that conforms to a curve having an initial convex portion followed by a concave portion, wherein the initial convex portion conforms to a negative second derivative with respect to the time interval, and the concave portion conforms to a positive second derivative with respect to the time interval with the ramping voltage determining the maximum voltage of alternating polarity driving pulses applied to the columns of the dielectric electroluminescent display and a column driver receiving the ramping voltage and in response applying alternating polarity driving pulses to the columns of said dielectric electroluminescent display, wherein said ramping voltage determines a maximum voltage of the alternating polarity driving pulses applied to the columns of said dielectric electroluminescent display*** as recited. Accordingly, Applicant respectfully submits that independent claim 1 and the claims dependent thereon distinguish patentably over the cited prior art and should be allowed.

In view of the above, it is believed the application is in order for allowance and action to that end is respectfully requested.

CONCLUSION

For at least the reasons detailed above, it is respectfully submitted that all claims remaining in the application (Claims 1, 3, 5-7, 9, 10, 12, 16 and 17) are now in condition for allowance. The foregoing comments do not require unnecessary additional search or examination.

☒ Remaining Claims, as delineated below:

(1) FOR	(2) CLAIMS REMAINING AFTER AMENDMENT LESS HIGHEST NUMBER PREVIOUSLY PAID FOR		(3) NUMBER EXTRA
TOTAL CLAIMS	**17**	**- 20 =**	**0**
INDEPENDENT CLAIMS	**1**	**- 3 =**	**0**

☒ This is an authorization under 37 CFR 1.136(a)(3) to treat any concurrent or future reply, requiring a petition for extension of time, as incorporating a petition for the appropriate extension of time. Applicants hereby petition the Commissioner under 37 C.F.R. § 1.136(a) and request a three month extension of time to respond to the outstanding Office Action.

☒ The Commissioner is hereby authorized to charge any filing or prosecution fees which may be required, under 37 CFR 1.16, 1.17, and 1.21 (but not 1.18), or to credit any overpayment, to Deposit Account Number 06-0308.

In the event the Examiner considers personal contact advantageous to the disposition of this case, he/she is hereby authorized to telephone John S. Zanghi, at 216.363.9000.

Respectfully submitted,
Fay Sharpe LLP

3/22/10
Date

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